Clean Set of Claims

53. An assay device comprising:

at least one chamber in fluid connection with at least one pathway, said at least one pathway being adapted to allow fluid to flow to/from said at least one chamber; and

means for selectively applying heat to at least one volume of a reversibly, thermally deformable material;

wherein there is provided said at least one volume of said reversibly, thermally deformable material in said at least one pathway which, in use, changes its state so as to cause a change of a rate of fluid flow along said at least one pathway.

54. An assay device comprising:

at least one chamber in fluid connection with at least one pathway, said at least one pathway being adapted to allow fluid to flow to/from said at least one chamber; and

means for selectively applying heat to at least one volume of reversibly, thermally deformable material;

wherein there is provided at least one recess located substantially adjacent said at least one pathway and, situated in said at least one recess, there is provided said at least one volume of said reversibly, thermally deformable material which, in use, changes its state so as to cause a change of a rate of fluid flow along said at least one pathway.

55. The assay device according to claim 53, wherein:

there is at least one recess located substantially adjacent said at least one pathway.

56. The assay device according to claim 54, wherein:

an opening is provided, said opening acting as a vent to or from said at least one recess.

57. The assay device according to claim 53, wherein:

said at least one volume of said reversibly, thermally deformable material is situated in said at least one pathway such that said at least one pathway is partially obstructed.

58. The assay device according to claim 53, wherein:

said at least one chamber includes a deformable envelope and at least two points of said envelope are connected by way of said at least one volume of said reversibly, thermally deformable material.

59. The assay device according to claim 53, wherein:

a region of said assay device has at least one hydrophobic portion so that a flow of said at least one volume of said reversibly, thermally deformable material is guided along a predetermined path.

60. The assay device according to claim 53, wherein:

at least one surface defined by or in said assay device is resiliently deformable.

61. The assay device according to claim 53, wherein:

a plurality of volumes of said reversibly deformable material are provided, each volume being accessible independently one from another.

62. The assay device according to claim 61, wherein:

each volume of said plurality of volumes of said reversibly, thermally deformable material is accessible independently and sequentially one from another.

63. The assay device according to claim 53, further comprising:

at least one of an inlet port, a reaction chamber, a waste depot, a filter chamber, an infinity capture and processing chamber, a wash solution/reagent reservoir, an array of metered readout cells and a breather tube.

64. The assay device according to claim 53, further comprising:

means for selectively removing heat from said at least one volume of said reversibly, thermally deformable material.

65. The assay device according to claim 53, further comprising:

means for selectively applying pressure to at least one region contained within said assay device.

66. An assay device comprising:

at least one chamber in fluid connection with at least one pathway, said at least one pathway being adapted to allow fluid to flow to/from said at least one chamber;

at least one volume of a reversibly, thermally deformable material situated in said at least one pathway which, in use, changes its state so as to cause a change of a rate of fluid flow along said at least one pathway;

at least one hydrophobic portion which defines a path along which said at least one volume of said reversibly, thermally deformable material is guided; and

means for selectively applying heat to said at least one volume of said reversibly, thermally deformable material.

67. An assay device including:

at least one chamber in fluid connection with at least one pathway, said at least one pathway being adapted to allow fluid to flow to/from said at least one chamber;

at least one recess located substantially adjacent said at least one pathway;

at least one volume of a reversibly, thermally deformable material situated in said at least one recess which, in use, changes its state so as to cause a change of a rate of fluid flow along said at least one pathway;

at least one hydrophobic portion which defines a reversibly, thermally deformable material path along which said reversibly, thermally deformable material is guided; and

means for selectively applying heat to said at least one volume of said reversibly, thermally deformable material.

68. An apparatus for varying a rate of fluid flow along at least one pathway, the apparatus comprising:

said at least one pathway and at least one volume of a reversibly, thermally deformable material disposed within said at least one pathway whereby, in use, a change of state of said at least one volume of said reversibly, thermally deformable material causes a change of said rate of fluid flow along said at least one pathway; and

means for selectively applying heat to said at least one volume of said reversibly, thermally deformable material.

69. Apparatus for varying a rate of fluid flow along at least one pathway, said apparatus comprising:

said at least one pathway and at least one volume of a reversibly, thermally deformable material disposed adjacent said at least one pathway whereby, in use, a change of state of said at least one volume of said reversibly, thermally deformable material causes a change of said rate of fluid flow along said at least one pathway; and

means for selectively applying heat to said at least one volume of said reversibly, thermally deformable material.

70. Apparatus according to claim 68, further comprising:

at least one chamber in fluid connection with said at least one pathway.

71. Apparatus according to claim 70, wherein:

said at least one volume of said reversibly, thermally deformable material is disposed within said at least one chamber.

72. Apparatus according to any claim 68, further comprising:

at least one recess capable of receiving said reversibly, thermally deformable material located substantially adjacent said at least one pathway.

73. Apparatus according to claim 72, wherein:

said at least one recess has an opening which acts as a vent in order to permit a flow of gas therethrough.

74. Apparatus according to claim 68, further comprising:

means for removing heat from said apparatus in order to increase or decrease a rate of said change of state of said reversibly, thermally deformable material.

75. Apparatus according to claim 68, further comprising:

means for supplying at least one of pressure, uv radiation, light and ultrasonic energy to said apparatus in order to increase or decrease a rate of said change of state of said reversibly, thermally deformable material.

76. Apparatus according to claim 68, wherein:

said reversibly, thermally deformable material includes a polymer.

77. Apparatus according to claim 68, wherein:

said reversibly, thermally deformable material includes polypropylene polystyrene.

78. Apparatus according to claim 68, further comprising:

at least one hydrophobic portion which defines a reversibly, thermally deformable material path along which the said reversibly, thermally deformable material is guided.

79. A method of varying a rate of fluid flow along at least one pathway comprising the steps of:

providing at least one recess substantially adjacent said at least one pathway;

locating at least one volume of a reversibly, thermally deformable material in said at least one recess; and

changing a state of said reversibly, thermally deformable material by application of heat so that at least a portion of said reversibly, thermally deformable material passes into said at least one pathway thereby substantially restricting flow of said fluid along said at least one pathway.

80. A method according to claim 79, wherein:

said at least a portion of said reversibly, thermally deformable material passes into said at least one pathway along a predetermined path.

81. A method of varying a rate of fluid flow along at least one pathway comprising the steps of:

providing said at least one pathway;

locating at least one volume of a reversibly deformable material in said at least one pathway so that said reversibly deformable material substantially restricts said flow of fluid along said at least one pathway; and

changing a state of said reversibly deformable material by application of heat so that at least a portion of said reversibly deformable material passes along a predetermined path, thereby permitting flow of said fluid along said pathway.

82. A method of varying a rate of fluid flow along at least one pathway comprising the steps of:

providing said at least one pathway;

locating at least one volume of a reversibly deformable material in said at least one pathway so that said reversibly deformable material substantially permits said flow of fluid along said at least one pathway; and

changing a state of said reversibly deformable material by application of heat so that at least a portion of said reversibly deformable material passes along a predetermined path, thereby substantially restricting flow of said fluid along said at least one pathway.

83. The method according to claim 80, wherein:

said predetermined path is defined by one or more hydrophobic regions.

84. The method according to claim 79, wherein:

said change of state of said reversibly deformable material is further controlled by applying to said reversibly deformable material at last one of pressure, uv radiation, light and ultrasonic energy.